Integrated system for multimedia messaging

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With the rapid advance of the information society, information volume and diversity is increasing, and access tools are branching out (telephone, fax, e-mail, etc.) in such a way that the search for improved information gathering capacity, faster transmission speeds, and more efficient operational management, has become a key issue in the business world (Fig. 1).

However, corporate communications systems are currently divided into telephone systems, centred on telephone and fax services, and computer systems, which focus on e-mail, in-house databases, and Web services, each system being run and managed separately. This results in the use of highly diverse communications means, splitting up of information resources, and the need to apply different access tools to get different information, which creates a whole host of concrete problems, such as a decline in knowledge worker*1) productivity, lost business opportunities, reduced client satisfaction, delays in decision making, increased TCO (Total Cost of Ownership)*2), and an inflexible infrastructure (equipment environment) that cannot adapt to change. In view of this, alignment and harmonization of telephone systems and computer systems is a growing need.1)

The target of system integration

At Oki Electric, in order to permit integration of telephone and computer systems which are currently separate, we have developed a system which takes message information (voice messages and text messages) in the multimedia information handled by the computer system and harmonizes it with the conventional telephone system. Here, this integrated system is called an "integrated multimedia messaging system" and the combined services offered by this system are termed "multimedia messaging services".

Oki's "objective" is to provide the customer benefits listed below, by offering a multimedia messaging system and related services.
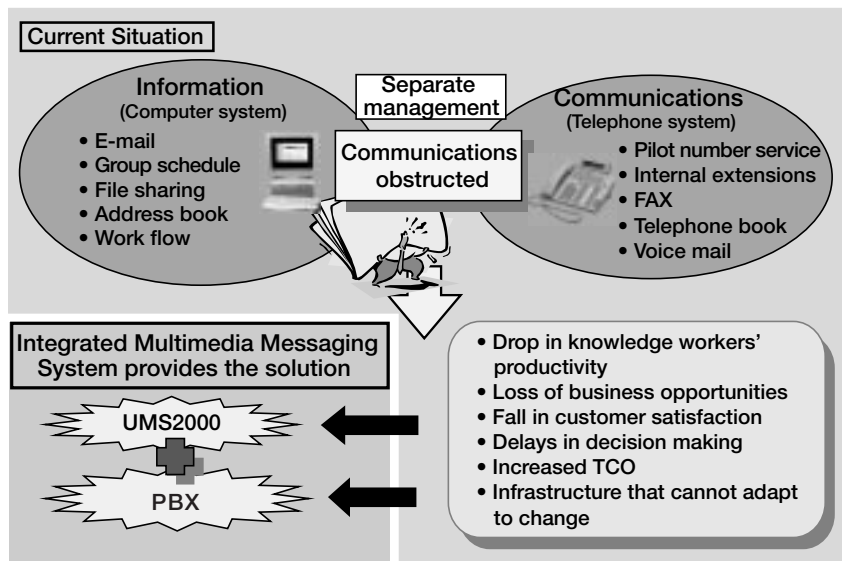

Fig. 1 Problems arising from separate management of computer and telephone systems

① The user is able to handle the system using any type of information and tools, to achieve a better integrated operation.
② Access is possible "whenever", "wherever", "to any type of information", regardless of location (in office, out of office), time, terminal (telephone, fax, PHS terminal, PC), or information type (voice, fax, e-mail).
③ Knowledge workers can freely select a working style that suits them and achieves the best productivity. Vast improvements in administration and production efficiency can be made.
④ By integrating the telephone system and the computer system, it is possible to achieve unified management of both resources (system data). Moreover, investment in equipment, and operation and management labour time and costs can be combined, and a competitive structure built on the basis of TCO cuts and flexible infrastructure design.

Taking the foregoing as our "target", at Oki, we have developed the "integrated multimedia messaging system", which combines various types of PBX and a unified messaging system*4) (hereinafter called "UMS2000"), which is one type of computer telephone system (Oki Product name CTstage*3)).

*1) A "knowledge worker" is a worker employed in tasks which use knowledge, or tasks which require innovation or creativity. *2) TCO (Total Cost of Ownership) indicates the total cost of owning an IT (Information Technology) resource, calculated by including not only the direct outlay required to purchase and maintain the resource, but also accounting for the personnel costs required to acquire, maintain, manage and utilize the technology, over a life cycle of several years.

Integrated multimedia messaging system

The integrated multimedia messaging system provides a service which integrates voice communications, fax communications, voice mail, fax mail and e-mail, by adopting a system structure which links various PBX and UMS 2000 systems.

Equipment composition

The system equipment composition(excluding terminals) consists of one PBX and four servers (Fig. 2). Below, a functional summary of the PBX and servers is described.

① **PBX**
A PBX controls calls between telephone terminal lines, public lines, leased lines, and server lines, and also controls terminals linked to various types of servers (lighting lamps when a mail is received on an internal extension, or reproducing a recorded message from a server when a particular key is pressed, or the like).

There are four corresponding types of PBX:
Medium/Small-capacity PBX: CTiOX[*3]
High-capacity PBX: DISCOVERY2000[*3]
Medium/Small-capacity IP-PBX: IPstage[*3]
High-capacity IP-PBX: DISCOVERY01[*3]

② **UMS2000 server**
Used to acquire information required in user registration for voice mail or fax mail, and in sending and receiving voice signals and various types of control signals, to and from the PBX.

③ **Exchange2000 [*5] server**
Used to acquire mail box information relating to e-mail.

④ **Dialler-link server**
Used to manage information required for search and automatic call origination from client PC.

⑤ **Domain controller**
Used to manage user information registered in ActiveDirectory[*5]

Multimedia messaging service

• **Mail link services**
(1) **Object**
To improve efficiency of telephone response management tasks and fax and e-mail transmission and reception management tasks, at the business interface with the customer.
(2) **Functions**
The following five service functions are offered to the user.

• The user can record and reproduce the contents of a call by a one-touch operation, using a multikey telephone, as well as getting the system to answer for him/her and record messages, when absent. The recorded voice mail can be managed as e-mail messages, which means that their contents can be forwarded directly to supervisors, or other relevant staff. These operations can be performed easily from the user's normal telephone or PC, meaning that he or she can choose an operating method that fits in with his or her own work style. What is more, recordings can also be replayed from an outside location.

• The user can view a list of voice mails on their PHS terminal, and by selecting a particular location on the display, is able to replay the recorded message. In order
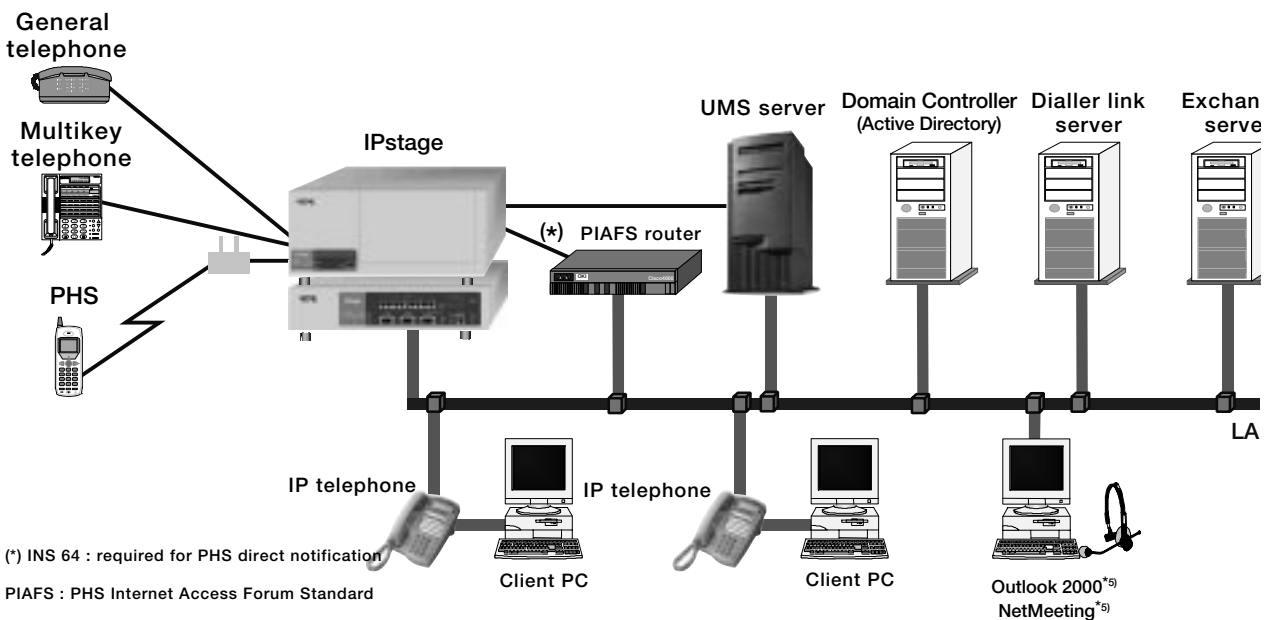

Fig. 2 Equipment configuration

that the user does not have to answer the phone during a meeting or having a visitor, the voice mail system records a proxy response and conditions, when the power of the PHS terminal is switched off, or when the user has gone out of the office and is out of area.

- The user is able to manage fax transmission and reception simply, on the client PC. Furthermore, since the saved information is managed in the form of electronic files, it can be stored, forwarded or retrieved via an external fax machine.
- The user can send an e-mail to a fax, or attach and send file attachments, such as Word[*5], Excel[*5] and PowerPoint[*5] files.
- Via their PHS terminal, the user is able to open, reply to and delete mails via the company's e-mail server, as well as sending new e-mails.

(3) Benefits

The user can avoid having to interrupt a task midway through in order to answer the phone, and he/she can concentrate on his/her task, meaning that the working efficiency of the knowledge worker can be improved. Moreover, tasks subsequent to answering the phone, such as memo writing tasks, telephone forwarding tasks, and so on, become unnecessary, and therefore wasteful chores can be eliminated. What is more, by avoiding the occurrence of message errors and forgotten messages, as well as unattended calls due to the user being busy with another call or absent from their post, it is possible to improve customer satisfaction and prevent business opportunities from being lost. To give an example, in a customer sample calculation based on 15 extensions, 230 internal PHS and 46 outside lines, a productivity increase of some 7,400 hours per year can be achieved.

When redistributing fax material, the user does not have to copy and resend the information, but can simply resend it by e-mail, which means a massive saving in paper resource consumption, and the work time involved in sending/receiving, sorting and managing faxes. Fax terminal running expenses (equipment costs, maintenance costs) can also be cut. Tentative calculations made by Oki Electric indicate running cost savings of some 250,000 yen per month, in the case of a customer with 400 employees and 100 direct inward dialling (DID) lines.

- **Digital Dashboard [*5] Linkage Services**

A "digital dashboard" is a system which enables all types of information (personal files, e-mails, work databases, websites, etc.) to be collected together and accessed via a single screen on the client PC (Fig. 3).

(1) Object

By providing unified management of various mail resources and telephone directories on the client PC screen, portal information can be processed and managed in a integrated and cohesive manner.

(2) Functions

The user can manage voice mail, fax mail and electronic mail via a single screen on the client PC. In addition, telephone numbers recorded in Active Directory can be searched on the PC, and by clicking on the corresponding entry, a call can be made to a particular person (linked calls can also be made from a multifunction phone on your own desk).

(3) Benefits

This service enables unified management of different types of mail information and integrated control of internal company information, via a single screen on the client PC, as well as granting the user increased speed and efficiency in information transmission, and rationalization and reduction of work time in information acquisition tasks. It also helps knowledge workers to improve their productivity.

What is more, administrators can manage phone numbers, mail addresses and network addresses from a single point, thus reducing the TCO.
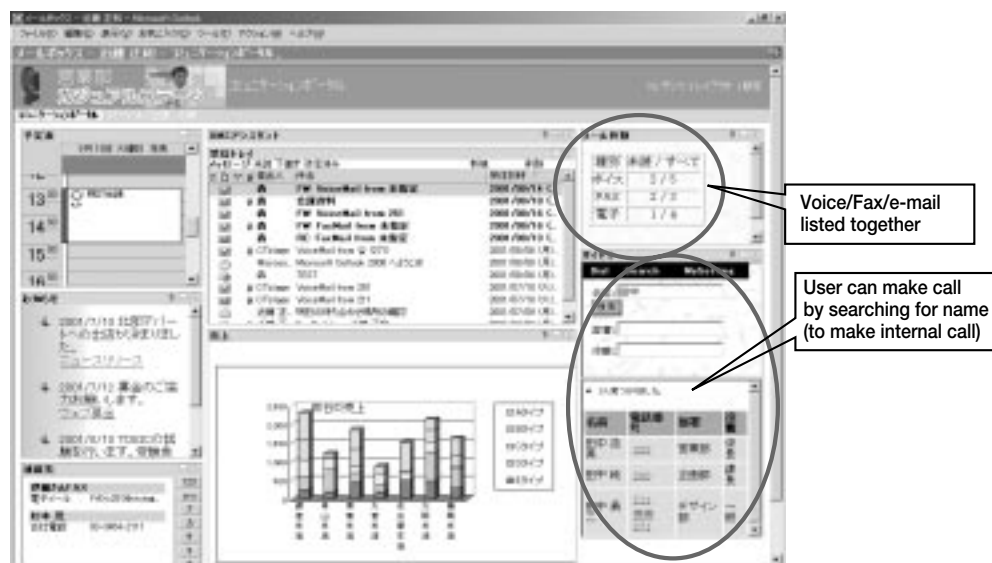

Voice/Fax/e-mail listed together

User can make call by searching for name (to make internal call)

Fig. 3 Digital dashboard linkage service

*5) Digital Dashboard, Exchange 2000, Active Directory, Word, Excel, PowerPoint, Outlook, Outlook 2000, NetMeeting, and Windows 2000 Professional are all registered trademarks of Microsoft Corporation.
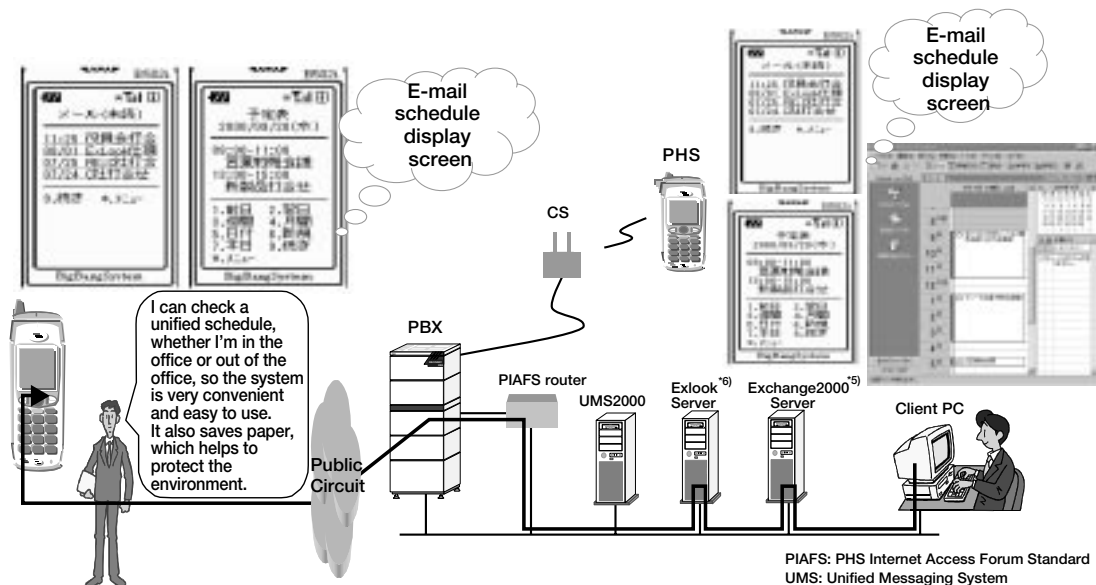
Fig. 4 Server linkage service

PIAFS: PHS Internet Access Forum Standard
UMS: Unified Messaging System

• **Server linking services**

(1) Object

Information management services, for instance, e-mail, schedule, address book and task information in Outlook [5] is supplied to a remote location via a PHS terminal.

(2) Functions

Via a PHS terminal, the user can read and send e-mails, as well as consulting, adding to or deleting entries in his or her schedule, address book, work information or memoranda.

(3) Benefits

The user is able to manage and control information via a PHS terminal, even when out of the office, thus cutting work time. Moreover, since the information can be retrieved "at any time" "from anywhere", without the user having to prepare and carry out management information each time he or she leaves the office, work tasks are rationalized and efficient use of resources (a paperless set-up) can be achieved. Since various systems can be accessed, and their information managed, from a remote source, response time is improved, leading to enhanced customer satisfaction, and preventing loss of business opportunities.

Conclusion

By unifying the telephone system and computer system, the integrated multimedia messaging system developed by Oki Electric provides the customer with excellent benefits, by helping them to increase corporate productivity, prevent lost business opportunities, improve customer satisfaction and speed up decision making.

The system's scalability means that any customer implementing it will be able to construct the service

functions they need, when and where they need them. So if a company only requires mail linking services, then to start with, it will install the minimum required system for this purpose, with the possibility of adding a server linking system, or the like, at a later stage. Even if extra systems are added subsequently, the same unified operating method can be preserved, so these additions can be made seamlessly, without creating any worries.

As described above, the multimedia messaging system offered by Oki Electric is able to adapt with great flexibility to any environment, allowing customers to choose a method of operation that suits their own working style. Oki has great confidence in the ability of this communications tool to improve information gathering capabilities, increase transmission speeds, and rationalize management and running tasks.

In the future, systems will need to be capable of rapid and flexible response to the diversification of terminals (portable information terminals, image terminals, etc.) and changes in network protocols (SIP [6] etc.), as well as improving usability and adapting swiftly to network infrastructure.   ◆◆

References

1) Yasubumi Chimura, Masashi Tsuboi : Oki Technical Review No. 185, "Multimedia messaging solutions", Vol. 68, No. 1, pp. 66-71, January 2001

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*6) SIP (Session Initiation Protocol) is an application-layer signal control protocol for generating, changing and deleting sessions defined by RFC2543.